



PROGRAM SEARCH SYSTEM AND SEARCH METHOD

BACKGROUND OF THE INVENTION

[0001] This invention relates to a search system for conducting searches of program guides and/or program content, preferably for digital broadcasting. Using a search request from a user, the system provides the search results to the user. The invention also relates to a receiving apparatus and a search apparatus, and a search method. As used herein the program guide and/or program content means the program guide information (typically the electronic program guide, or EPG), as well as information relating to data broadcasting (for example, character information and/or picture information) in digital broadcasting or the internet.

[0002] One method for providing the EPG in communication satellite digital broadcasting is to transmit the EPG through a channel which may be exclusively used for that purpose. A method for providing the data broadcasting in digital broadcasting is to use a data format for communication with provision of the data channel having a down-link which is faster than a telephone circuit.

SUMMARY OF THE INVENTION

[0003] With BS technology digital broadcasting, in addition to the broadcasting service of 7 channels of high definition digital TV programs, or 24 channels of the digital programs of normal TV, a data broadcasting service of supplying information relating to the TV programs and independent data information which does not relate to the TV programs is envisioned. Those broadcasting services will be provided through channels which are occupied by TV stations, with each TV station providing it's own broadcasting service. For those broadcasting services, the EPG is provided to assist the viewer in the selection of TV programs. This EPG can be divided into an EPG for all TV stations, as a whole, and an EPG for each TV station, for introducing its own programs. The EPG for all TV stations is supplied through eight (8) carriers from the satellites; therefore, addressees (or subscribers) can obtain the EPG for all TV stations, even if they do not receive all of the channels. For the viewers, however, who receive the EPG for each TV station, they know only the programs which are independently provided by the each of the broadcasting stations. The

method for providing this EPG is different from that of the EPG for the satellite digital broadcasting programs.

[0004] Further, with the data broadcasting service of the BS digital broadcast, data broadcasting services at each station provide a numerous services, such as shopping, etc., in the format of BML or XML. This is transmitted with the mixture of video and audio packets, being inserted into the data packet of a transmission format of the BS digital broadcasting. In the satellite broadcasting, the data channel is provided exclusively, and a data format for communication is used, thereby providing a down-link faster than a telephone circuit. The BS system data broadcasting appears similar to the data broadcast which is inserted into the vertical retracing interval in analogue broadcasting. The data of the BS data broadcasting, however, is on the order of 1.5Mbps - 40 Mbps. This high speed data service is about 100 times the size of the smaller amount of data, 30kbps - 40kbps, in the data broadcast of analogue broadcasting. With the data screen, it is a service of using the BML or XML which can perform the high definition display, comparing to the HTML that is used in the Internet very often.

[0005] The subscriber can receive the data broadcasting services which are supplied to that station, the EPG for all TV stations, and the EPG for each TV station. The user, however, cannot obtain the EPGs for each of the other TV stations, and the contents of the data broadcasting services thereof, unless the receiving channel is changed. These services provide a large quantity of data from a satellite to a large number of homes in one direction cheaply, in a real-time manner. Almost of the services, however, are temporal in nature, i.e., they are not continuously available. This is an aspect different from the Internet, where information can be viewed by a user at almost any time.

[0006] If a large capacity memory apparatus is provided in the TV receiver, so as to scan all the channels received and memorize the EPG information for all TV stations and from the data broadcasting service, it would be possible to see all of the service contents. If, however, scanning must be done on all channels continuously, for the purpose of storing the information transmitted from the satellites, with conventional bandwidth limitations it would be difficult to view the TV programs. Furthermore, even if the information could be stored by scanning the channels received, just the data from the data broadcasting would amount to several thousands of pages. Thus a long time would be required to see that data on the screen. Daily changes in content of the broadcasting services make it still more difficult.

Furthermore, providing even a little of this capability would increase the cost and complexity of the receiver.

[0007] According to this invention, a system in a form of a search service center provides viewers with a search service, and a report in response to search requests. The report responds to inquiries (i.e., which channel and when), as well as information from the data broadcasting service. The information is provided in real-time, unilaterally, as the broadcasting service operates. Accordingly, the service is effective, providing or supplying information and materials to the viewers responding to their inquiries. By providing the search apparatus separately from the broadcasting stations and the home receivers, the household receiver can have minimal functionality, making operation easier and the receiver lower in cost.

[0008] Preferably, a database is constructed by receiving the EPG information from the digital broadcasts, and the content information of the data broadcasts, for all channels. A keyword search database can also be used, wherein the search service is provided to the viewer responsive to the requests for information. Thus the viewer can selectively view only what she/he wishes among the large amount of information broadcast.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] These and other features of the invention will be apparent from the following description, when taken in conjunction with the accompanying drawings, wherein:

[0010] Figure 1 is a block diagram illustrating a search service;

[0011] Figure 2 is a block diagram showing the structure of a search service center;

[0012] Figure 3 is a diagram of an example of a relationship between the search service center and data broadcasters;

[0013] Figure 4 is another diagram of an example of a relationship between the search service center and data broadcasters;

[0014] Figure 5 is a diagram showing flows of information and fees relating to the search service center;

[0015] Figure 6 is another diagram showing flows of information and fees relating to the search service center;

[0016] Figure 7 is a diagram showing other services provided by the search service center;

- [0017] Figure 8 is a diagram showing flows of information and fees for the system shown in Figure 7;
- [0018] Figure 9 is a diagram showing other devices for a search service;
- [0019] Figure 10 is a diagram of a search service center and a CATV distributor; and
- [0020] Figure 11 is a diagram showing other devices for providing a search service.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0021] Figure 1 shows an example of system as a device or mechanism for providing search services for an electronic program guide and for data broadcasting services, such as in the BS digital broadcasting system. A provider 1 of the BS digital broadcasting transmits video and audio information, such as for TV programs. A plurality of the broadcasters 2 collect the data broadcast contents transmitted from the suppliers 3. They then broadcast the content through a broadcasting company 1, for example, using a satellite 4. At the homes, this broadcast is received by a receiving terminal 5, such as a suitably equipped personal computer, a set-top box, or a TV. The receiving terminal 5 includes the capability of transmitting information through an up-link, for example, through a telephone circuit 6. This up-link enables the receiver to deal with the services provided, such as, interactive TV, receipt of data broadcasting, independent shopping, etc. Also using this, search requests can be sent by the viewer to the search service center 7. The search service center 7 transmits information on the broadcasting channels, etc., answering the search request.

[0022] Figure 2 illustrates a preferred embodiment for the device at the search service center 7 for providing the search service. In the service center 7, the EPG information and the content data from the data broadcasting on all the channels are received, typically by an antenna 8 and a group of receivers 9. The combined information is accumulated or stored in a data file 10. At the same time, from the EPG information and the content data of the data broadcasting, keywords are extracted using a search engine 11, and are stored in a database. The content data of the data broadcasting will typically be in the expression of the tag format of BML or XML, enabling the keywords to be extracted in the same manner as HTML over the Internet.

[0023] At home, when the viewer transmits the search request (for example, the keyword) for the information sought from the receiver terminal 5, the request is entered into this search center through the telephone circuit or the communication circuit, and then a list

of the information relating to the keyword is extracted. Then the content searched and extracted is transmitted to the receiving terminal 5 of that viewer through the telephone or communication circuit. Doing so, the viewer obtains the desired information, e.g. information from a data channel that the requested program is to be broadcast at a specific time. This enables the viewer to receive and view the program on that channel. Further, even if the information relating to the keyword does not relate to the present channel being received, that information can be delivered through the telephone circuit 6. Depending upon the amount and/or content of the request, the data broadcasting channel can be delivered from a sender (or transmitter) 12 to the home through the broadcast station. By adding a search screen for the search service into the data broadcast, the viewer can conduct search operations on that search screen, enabling ease of communication with the search center.

[0024] In the preceding description, the general telephone circuit 6 was used for communication to the search service. Of course, however, the Internet can be used as the communication circuit, and a search database provided for the information provider on the Internet. Within the search service center 7, the search service can be performed without a barrier between the broadcasting and the Internet, so that the viewer can view them together. In this case, link information for the Internet is stored in the data file 10, together with a broadcasting archive, in which are arranged the EPG data for all stations, the EPG data for each station, the content data of data broadcasting and the search keyword, as well as, customer information, e.g. a the users search history.

[0025] With using such the present search service, it is not necessary to accumulate or store the large amount of data, while always scanning channels by the receiver. The viewer can see the desired information quickly on the receiving terminal, which is thereby simple to operate and low in cost.

[0026] Of course, the search request from the receiving terminal 5 can be done at no cost to the user. Alternatively, if there is a charge, the system can assure that the user has credit. For example, the user can be asked to file a predetermined application before being permitted to use the service. This application can be taken by the user entering the information on a predetermined screen, and the search service center can start the search service to the user. Typical information would include name, address, age, occupation, telephone number, mailing address, a credit card number, or a bank account number. It can also include preference information such as answers to an attitude survey and/or a

questionnaire. Approval to start of service, re-confirmation if the user wishes to receive the service at the stated charge or not, or a consent to provide viewer history. With acceptance, the service can be started through the telephone line and/or the communication line.

[0027] In addition to the basic service of locating information for which the search request is made, the search service center 7 can provide the broadcast contents in response to the request. When the contents charge, because of copyright issues, it may be necessary to make an agreement relating to the re-use of the broadcast contents. If it is possible to make the agreement with the broadcaster and/or the information supplier, the chargeable supply of the broadcasting content can be greater. If consent is made with the provider A 16, while not with the providers B 17 and C 19, the providers B 17 and C 19, with whom the consent cannot be obtained, are asked to prepare files of the broadcast contents by themselves. The search service center 7 transfers the request for search material to the providers B and C, using a transmitting device 15 for sending and receiving the information between the providers of the data broadcast, and it receives the file of the contents, so as to transmit them to the viewer. In addition, if desired, information about tendency of the viewers, based upon the search requests made by the viewers, from the search service center can be given to the providers in a report.

[0028] Figure 4 is a diagram showing a mode where the consent cannot be obtained for the re-use of the broadcast contents in the search service center 7. In this mode the broadcast contents will not be stored in the data file 22 of the search service center 7. Therefore the search service center 7 offers only the supply of the broadcast contents 21, 18 and 20 by the broadcasting providers A, B and C, respectively.

[0029] Figure 5 is a diagram showing another mode for the search service center 7. Thin arrows indicate the flows of the information and service, while thick arrows show the flow of charges or fees. The search service center 7 provides a search report, such as, a location number for the Internet information, in addition to the EPG information and the timing and channel of the data broadcasts, responding to the search request from the receiving terminal 5. Further, when the request is made for a broadcast from the receiving terminal 5, the search service center 7 provides the content. As consideration for those services, the search service center 7 collects a search fee from the viewer. In this instance, the charge information may be determined so that the cost or fee depends upon the difficulty of the search, the content of the request and the amount of information in the report. It

important from a business view point to set a low price for a simple search, so as to activate the use of the present search service. Also, payment must be made for the copyrights to the broadcasters, for example, the data broadcasting provider 2 under the contract for re-use of the contents. Further, the search service center 7 can also prepare customer trend information, such as, market trends and preference trends, etc., upon basis of the search requests from the viewers. Accordingly, it can supply the data broadcasting providers with the customer trend information, and thereby obtain a fee for supplying the information. Thus the charge information may be determined so that the cost is different depending upon the content or an amount of the information. Of course, the charge can be collected using a credit card number or an account number of banking institution.

[0030] Figure 6 shows the flow of charges when the consent cannot be obtained on the re-use of the broadcasting data. Though the material cost paid by the viewer is delivered to the data broadcasting provider, the search service center can receive a portion of the material cost as a mediation fee.

[0031] Figure 7 shows another mode of the search service center 7. In Figure 7, a window 23 for service of advertisement and/or mediation is provided in the search service center 7. The window 23 for advertising and/or mediation service accepts a request for advertisement and/or an introduction of business, and registers them into the data file. The data file 10 introduces the advertisements and/or the business location or address and the business content thereof, relating to the search report information, when the search report information is supplied to the viewer.

[0032] Figure 8 is a diagram showing the charge flows for the search service center 7 shown in the Figure 7. The search service center 7 can obtain the advertisement fee and the mediation fee from each of the various providers 24, as consideration for the services of advertisement and/or mediation. The fees can be set to be uniform or depend upon the content of the service, but preferably is a combination between a uniform fee for registration and fees proportional to the number of the uses made.

[0033] The supply of the data screen materials to the users, in relation to the advertisement and/or mediation, is conducted with consent of the data broadcast providers 2 and/or the supplier of information. When it is not necessary to supply the data screen materials relating to the advertisement and/or the mediation, this consent is not necessary. Then the search service center supplies the viewers with the location information of the data

broadcasting and/or the location information of the related information thereof on the Internet, etc. If the search service center produces a market report on the viewer's tendencies from the access data made by the viewers to supply it to the broadcast providers, it can be put to practical use, for example, in determining whether to increase or decrease particular programs, or in deciding to re-broadcast programs. In this system, search fees from the viewers, service fees relating to advertisement and mediation from the providers, and subscriber fees for reports are potentially applicable. An important aspect is to increase access from the viewers; therefore it is preferable to lower the search fees from the viewers to promote use by the viewer, thereby activating the businesses in the services relating to the advertisements, mediation, and reporting features.

[0034] Of course, the search service center 7 can operate as an independent business for the BS broadcasting system mentioned above. It can also operate as a part of an organization for the data broadcast provider 2, as shown in Figure 9.

[0035] The explanation above assumed the broadcast is received directly from the satellite, however, the broadcast can be received and transmitted again in the present search service system, for example in a CATV system. In this case, the provider of the CATV supplies the viewers with the program services of satellite broadcasting, the programs of broadcast by local antennas, and the program services which are edited or produced independently. In CATV, the EPG must be revised to suit that channel arrangement.

[0036] Figure 10 is a diagram of the relationship between the search service center 7 and the CATV provider 25. In the case of the CATV system, the search request from the receiving terminal 26 at home reaches the CATV provider 25 through a bidirectional cable 27. Accordingly, if the EPG information and the data broadcast information received by the search service center 7 are supplied to the CATV provider 25, the CATV provider 25 can provide them to the viewers. In this instance, the search service center 7 can obtain an income from the supply of the information to the CATV provider 25.

[0037] For CATV, there exists an original or unique information supply service, i.e., supplying the information closely related to an area or region. If this original information is inserted into the data area of an original program, so as to be supplied, in the form of the screen image which can be displayed by the BML and XML in the same manner of the satellite broadcasting, then a that business can be developed as a CATV station.

[0038] Figure 11 shows a search system unique to CATV. In the service area of the CATV, a regional center 30 is disposed, which has a group of CATV receivers 28 and a search engine 29, and the search information unique to the CATV is transmitted to the search service center 7 through the telephone circuit 6. Therefore it is possible to supply appropriate search information to the CATV provider. If the content data of the CATV broadcasting is formed by using the content file of the CATV station, the CATV provider and the present search service center can exist together. An advantage results that there is no necessity of a large file in the regional center.

[0039] Since the CATV system is centralized in each area or region, the regional center is disposed for each of the areas of the CATV stations. This allows connections between the search service center through a network, such as the Internet, thereby enabling the viewers to use the search for wide area information, as well as regional information.

[0040] The present invention has applicability beyond the search service. As mentioned previously, viewers can receive and obtain the EPG for all stations without necessity of the channel selection on the receiving terminal. Typically, however, they cannot receive and obtain the EPG for each station unless they select that channel on the receiving terminal. Then, the EPG for all stations and the EPGs for each station, which are received and collected in the present search service center, are hierarchically combined. Thus they can be supplied through a data broadcasting channel, improving the convenience and usability of the data for the viewer. The characteristic of this service lies in, not only that the EPG for all stations combined with the EPGs for each station, but also that a service guide for the data broadcast service of each station is supplied at the same time.

[0041] As mentioned, this system can provide trend information about the viewers. When the receiving terminals, each of which can collect a history of receiving and sending of information, are sold, in cooperation with a manufacturer of the receiving terminals, the histories of the viewers are collected from the receiving terminals. This can be done automatically with the telephone network or the Internet subject to consent of the viewers. By combining the information of general audience rating and the positive audience information obtained in the search service, it is possible to better understand the users preferences. Further, the preference information is also important for the viewers, enabling them to decide what to see among a mass of the information. Information services, such as "Top Ten" popular with audiences can be determined. If the audience information mentioned

above is supplied as a program in the form of the data broadcast, viewers, being interested in the tendency or trend of audience and topics, may view the information. Therefore, publishing the advertisement on this screen provided is effective, and the broadcasting business can be improved. In particular, with the data broadcasting service, since it is possible to supply the program guides and the preference of the audience for all stations, in real time, the audience ranking of the data broadcasting services is more effective. Namely, the viewer can view the data broadcasting service on topics, using the audience ranking information. By combining the EPG service, the search service, and the viewer information service, a new business can be established for supplying information about the data broadcastings.

[0042] Although the foregoing explanation was based on the BS digital broadcasting, the present invention should not be restricted only to this. The embodiments mentioned above also can be applied to digital broadcastings, in general, such as the ground wave digital broadcasting or other satellite digital broadcasting.

[0043] While we have shown and described several embodiments in accordance with our invention, it should be understood that the disclosed embodiments are capable of being changed without departing from the scope of the invention. The scope of the invention can be understood by the appended claims.